

Region 3 GPRA Baseline RCRA Corrective Action Facility

IBM Manassas

**9600 Godwin Drive
Manassas, VA 20110
Congressional District 10
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Current Progress at the Site

A program has been implemented to remediate and monitor a plume of perchloroethylene (PCE) in the groundwater extending from the facility in Manassas, Virginia three miles to a public supply well in Prince William County. The remediation program includes groundwater pump and treat, groundwater monitoring, and soil vapor extraction.

The groundwater pump and treat portion of the remediation program was initiated in 1985 and now consists of three pumping wells, one public supply well, and an additional pilot pumping well. Extracted groundwater is treated with two stage carbon adsorption systems. Spent carbon is recovered at an offsite facility. As of December 2002¹, the groundwater pump and treat system has removed a total of 1,097 gallons (14,787 pounds) of PCE from the groundwater. In 2002, PCE concentrations averaged 13,729 ppb, 4,770 ppb, 40.9 ppb, 729 ppb, and 67.6 ppb in well locations D-39, D-28, D-47, OF-34, and PW-07, respectively. These values show reductions from a high concentration of approximately 9000 ppb (1992), 290 ppb (1990 - D-29 data), 4,250 ppb (1991) and 200 ppb (1990) in well locations D-28, D-47, OF-34, and PW-07, respectively.

The soil vapor extraction system was initially tested in 1988 and is comprised of five extraction wells and seven air inlet wells located on either side of Building 101. The system removes PCE from the soil vadose zone around Building 101. As of December 2002, the vapor extraction system has removed a total of 1,648 gallons (22,247 pounds) of PCE from the environment. In 2002, average PCE concentrations in air samples removed from the soil vadose zone was 2.7 parts per million by volume and ranged from 79 micrograms of PCE per liter to 4.3 micrograms of PCE per liter. This value shows a reduction from an approximate concentration in 1990 of 1,800 ppmv.

Groundwater data from monitoring wells has been collected since the late 1980's. The monitoring includes analyses to confirm that the volatile organic compounds (VOCs) in the plume are being contained and that progress towards the cleanup goals is being achieved. The current monitoring program requires monthly groundwater level measurements from 82 monitoring wells, monthly analysis of VOC concentrations in groundwater from the five pumping wells (4 monitoring wells and 1 public water supply well), and quarterly or annual analyses of groundwater from 25 monitoring wells, 5 public water supply wells, and 6 private

¹ Based on information presented in the Corrective Measure Implementation Program 2002 Annual Progress Report dated April 8, 2003.

water supply wells. Evaluation of groundwater level and groundwater quality data collected thus far demonstrates that the pumping wells have contained the VOC plume.

IBM continues to implement the full remediation program including groundwater pump and treat, soil vapor extraction system, and groundwater monitoring.

IBM submitted three workplans in 1999, in response to EPA's request.

1. Vapor Extraction System Shutdown Investigation Workplan

This workplan was requested because IBM has observed diminished removal of PCE through the system and is considering eliminating the system. EPA requested, and IBM submitted a plan, to determine whether shut down of the vapor extraction system (VES) will impact groundwater contamination or air quality and whether continued mass removal by the VES is insignificant relative to IBM's ability to meet the remediation goals. EPA is reviewing IBM's workplan. Since EPA made this request, EPA has focused its resources on addressing uncontrolled environmental indicators, including evaluating the effect of groundwater and soil contamination on indoor air. The development of related guidance has delayed EPA Region III's response to IBM..

2. Groundwater Plume Characterization Workplan

While previously uncontaminated wells are routinely monitored to ensure that the contaminated groundwater plume is contained, IBM has not monitored the interior perimeter of the plume since 1992. EPA requested IBM to assess the plume size to complete a review of the remediation program. Since EPA made this request, and IBM submitted a Workplan, EPA has focused its resources on addressing sites with uncontrolled environmental indicators and has deferred this portion of IBM's assessment.

3. Corrective Measures Review Workplan

EPA requested this workplan because IBM determined that the current remedy is not substantially reducing the concentration of contaminants in the groundwater in the suspected source area, and also, Prince William County discontinued pumping the principle well which has drawn the contaminant plume three miles from its source. Since EPA made this request, and IBM submitted a Workplan, EPA has focused its resources on addressing sites with uncontrolled environmental indicators and has deferred this portion of IBM's assessment. In addition, results from the 2002 Annual Progress Report appear to indicate contaminant reduction is now occurring at each of the compliance and trend wells which may indicate that the current implemented "corrective measure has stabilized and is progressing toward its intended goal".

Site Description

In 1969, IBM began operating a 600-acre facility located in north central Virginia, approximately 25 miles southwest of Washington, DC. The principal activities at the Facility were semiconductor design and the manufacturing and development of electronic defense systems. Although IBM continues to retain the responsibility for RCRA corrective measures implementation at the Manassas facility, the facility now contains portions owned and operated by other businesses, including the Lockheed Martin Corporation and Micron Technology, Inc.

Through investigations implemented by IBM from 1978 through the early-1980's, IBM identified the presence of elevated volatile organic compounds in onsite soils and groundwater. As a result of the initial investigations, IBM removed one 10,000-gallon waste solvent tank and two 20,000-gallon waste acid tanks, closed two underground tanks and associated appurtenances, removed 1227 tons of contaminated soil which were disposed in an EPA-approved hazardous waste landfill, treated soil to raise the pH in contaminated soils and immobilize fluoride, and installed 49 onsite wells and 45 offsite wells to monitor groundwater. Subsequently, IBM provided city (Manassas) water hookups to five (5) residences, assisted the Prince William County Service Authority in installing and monitoring a groundwater treatment system for its public supply well, implemented a groundwater pump and treat system, and implemented a pilot soil vapor extraction system.

On March 1, 1989, EPA and IBM entered into a Consent Order requiring IBM to complete its onsite and offsite investigation of the nature and extent of the contamination and conduct a study to evaluate various cleanup alternatives. The requirements of the order were satisfied with EPA's approval of the CMS Report on March 8, 1990. The final remedy selected by EPA on July 25, 1990 provided for the addition of one offsite pumping well to the existing groundwater pump and treat system and continued the pilot soil vapor extraction system. On February 11, 1991, EPA and IBM entered into a second Consent Order requiring IBM to implement the selected remedy. As a result of local approval requirements, the new offsite pumping well did not begin operating until August, 1997.

Site Responsibility

RCRA Corrective Action activities at this facility are being conducted under the direction of EPA Region 3 with assistance from the State.

Contaminants

Cleanup goals were established for the pumping wells based on Maximum Contaminant Levels (MCLs) and 10^{-6} cancer risk-based levels. MCLs are federally enforceable drinking water standards developed under the Safe Drinking Water Act which are published at 40 C.F.R. Part 141, Subpart B. The 10^{-6} cancer risk-based level represents the concentration of a carcinogen such that a person of average weight drinking two (2) liters/day of water containing 0.67 micrograms/liter of the contaminant would have no more than a one (1) in one (1) million chance of developing cancer from drinking the water during a 70 year life span. EPA acknowledges that it may be technically impossible to achieve these cleanup goals and has provided in the Consent Order that IBM may petition for alternative goals in the future (as long as drinking water continues to be treated to levels no less stringent than an MCL).

The principle contaminants in soil and/or groundwater associated with releases from IBM's operation of the plant and breakdown products from the releases are perchloroethylene (PCE), trichloroethylene (TCE), and 1,2-trans dichloroethylene (trans 1,2-DCE). The compound 1,1,1-trichloroethane (1,1,1 TCA) is also in onsite and offsite groundwater and possibly originated from an offsite source. These chemicals are all in a class of chemicals called "volatile

organic compounds" or VOCs.

The MCL identified in the final remedy is 5 ppb for PCE, 5 ppb for TCE, 70 ppb for trans 1,2-DCE, and 200 ppb for 1,1,1 TCA. The 10^{-6} cancer risk-based level in drinking water that is identified in the final remedy is 0.67 parts per billion (ppb) for PCE and 3 ppb for TCE. The compounds trans 1,2-DCE and 1,1,1 TCA are toxic to the body but do not induce cancer.

Community Interaction

EPA solicited public comments on the preliminary identification of the final selected remedy for 30 or more days during March and April of 1990. Two comments were received. IBM opposed the requirement to meet a cleanup goal for 1,1,1 TCA because it is not believed that IBM is the source of the 1,1,1 TCA in the groundwater. EPA retained the cleanup goal for 1,1,1 TCA because IBM's recovery wells had caused the compound to migrate onto IBM's property. A citizen concerned with property values, environmental effects, and public safety opposed the selected location for the additional offsite well. IBM resolved this issue by working with the residents to design and develop a housing for the well pump and treatment system which met their approval.

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For more information about EPA's correction action webpage, including Environmental Indicators, please visit our site at: www.epa.gov/reg3wcmd/correctiveaction.htm

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